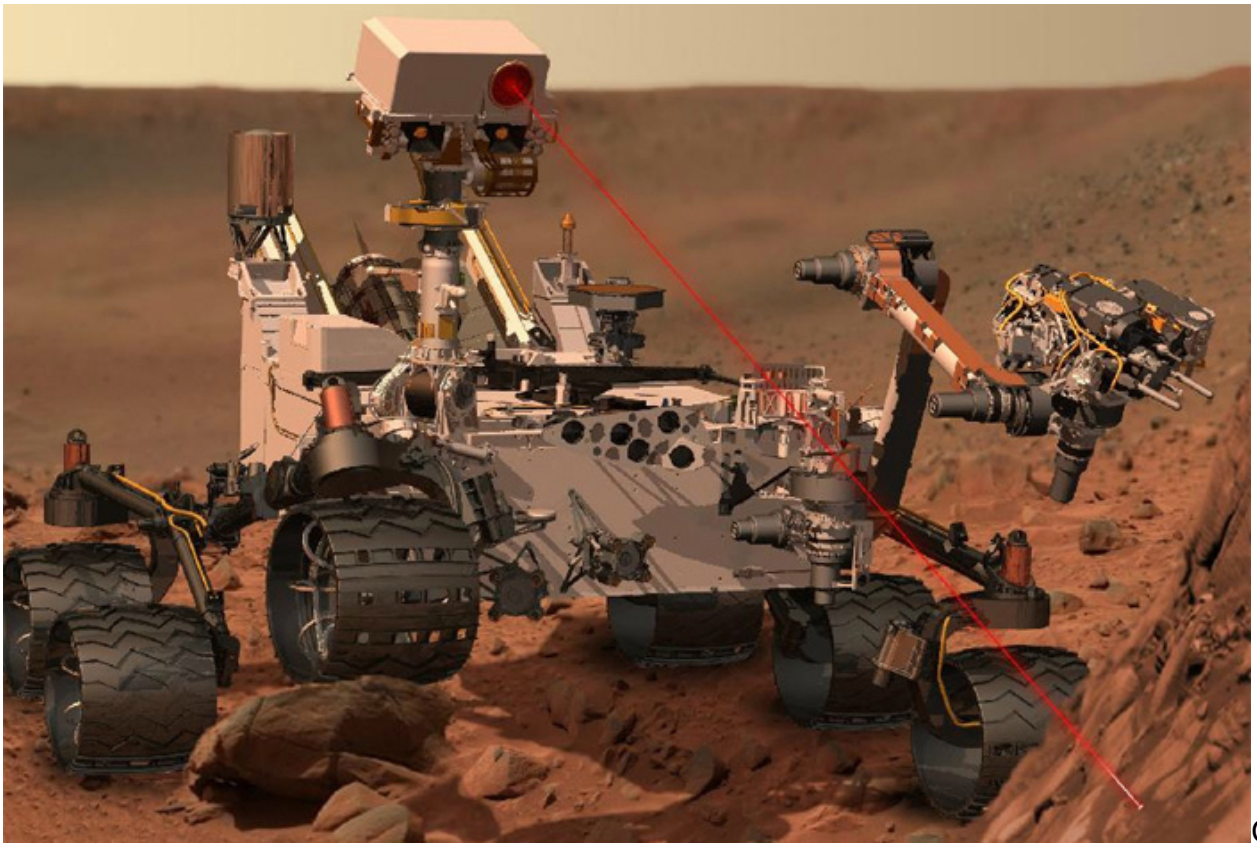
Of lasers, glass, and marshmallows

February 1, 2017



ChemCam is a device on the Mars Science Laboratory rover, Curiosity. How it works is that light from the target plasma is captured by the telescope and travels down a fiber optic cable to be analysed by the spectrometer located in ChemCam's "body unit" inside the rover. Los Alamos National Laboratory provided the spectrometer instrumentaiton.

NASA's website explains what this equipment is doing on Mars:

ChemCam will fire a laser and analyze the elemental composition of vaporized materials from areas smaller than 1 millimeter on the surface of Martian rocks and soils. An on-board spectrograph will provide unprecedented detail about minerals and microstructures in rocks by measuring the composition of the resulting plasma—an extremely hot gas made of free-floating ions and electrons.

The results of the measurements are sent back to scientists on Earth so we can all learn about Mars and its composition.

A student in one of our education programs originally asked this question, and we reached out to our friend Roger Wiens, who is one of the co-principal investigators for ChemCam and a Lab scientist. This is what Roger told us:

These students have good heads on their shoulders! The laser would not spark on a piece of smooth glass. But if you roughened up the surface with sandpaper, the glass would lose its transparency, and you would get a spark.

We are reminded of the time we tried to roast a marshmallow in our solar furnace. The marshmallow is so white that it reflects the heat quite well. Then, we tried rolling it in cocoa powder…

Once the surface was dark, the marshmallow absorbed the heat and melted. If you try this at home, you could end up with a sticky mess.

Gordon McDonough, Science evangelist

Occasionally questions are sent in to edu-bsm@lanl.gov or are left in our feedback box in the Museum.

We work to provide answers to these questions on our blog and the site where we list our favorite questions and answers.